

Application/Control Number: 09/740,284  
Art Unit: 2654

Docket No.: 2000-0102

### **REMARKS**

Reconsideration and allowance in view of the foregoing amendments and the following remarks are respectfully requested.

By this amendment, claims 1-20 are pending, claims 1 and 10 are amended to clarify the claim language and not for patentability or to narrow the claim scope.

### **Oath/Declaration**

The Declaration was separately signed by each inventor at the time the application was filed and each Declaration should be on the PTO records. To insure that the PTO has a complete record, attached is the declaration as signed by inventor Fernando Carlos Pereira.

### **Rejection of Claims 1-20 under 35 U.S.C. 103(a)**

On page 2 of the Office Action, the Examiner rejected claims 1-20 under 35 U.S.C. 103(a) as being unpatentable over Singhal et al. ("AT&T at TREC-7") in Proceedings of the Seventh Text Retrieval Conference (TREC-7) ed Voorhees et al., July 1999 ("Singhal") in view of U.S. Patent No. 5,559,940 to Hutson ("Hutson"). Applicants respectfully traverse the rejection and submit that there is insufficient motivation or suggestion to combine these references and further, even if combined, these references fail to teach the claimed inventions.

Referring to claim 1, Applicants submit that there is a lack of sufficient motivation or suggestion to combine these references. The Examiner states that the concept of truncating the vectors by removing all terms in the vectors that are not recognized by the recognizer, thereby creating truncated vectors, is "well known in the art, as taught by Hutson." The Examiner then concludes that because Hutson teaches removal of unwanted words (col. 2, lines 12 - 20; col. 4, lines 61 - 67) that it would be obvious to modify Singhal by Hutson

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“since it is well known in the art at the time of the invention for the purpose of reducing the size of the database for a more efficient search ... by including (only) words also proposed by the speech recognizer.” Applicants traverse this analysis and submit that insufficient motivation exists to combine these references.

To establish a *prima facie* case of obviousness, the Examiner must meet three criteria. First, there must be some motivation or suggestion, either in the references themselves, or in the knowledge generally available to one of ordinary skill in the art, to combine the references. Second, there must be a reasonable expectation of success, and finally, the prior art references must teach or suggest all the claim limitations. The Examiner bears the initial burden of providing some suggestion of the desirability of doing what the inventor has done. “To support the conclusion that the claimed invention is directed to obvious subject matter, either the references must expressly or impliedly suggest the claimed invention or the examiner must present a convincing line of reasoning as to why the artisan would have found the claimed invention to have been obvious in light of the teachings of the references.” MPEP 2142.

In the present case, the Examiner has relied on the argument that the concept not taught by Singhal is “well known in the art.” However, the MPEP notes that any “statement that modifications of the prior art to meet the claimed invention would have been ‘well within the ordinary skill of the art’ at the time the claimed invention was made’ because the references relied upon teach that all aspects of the claimed invention were individually known in the art is not sufficient to establish a *prima facie* case of obviousness without some objective reason to combine the teachings of the references. *Ex parte Levensgood*, 28 USPQ2d 1300 (Bd. Pat. App. & Inter. 1993). See also *In re Kotzab*, 217 F.3d 1365, 1371, 55 USPQ2d 1313, 1318 (Fed. Cir. 2000).” MPEP 2143.01. Accordingly, the Examiner still has the burden of objectively explaining and establishing the *prima facie* case of obviousness. Applicants submit that the objective case has not been made.

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Applicants will provide contrary reasoning and explain why, under the preponderance of the evidence standard, one of skill in the art would not find sufficient motivation or suggestion to combine Singhal with Hutson. The examiner must consider Applicants' evidence supporting the patentability of the claimed invention and the ultimate determination of patentability is based on the entire record, by a preponderance of evidence, with due consideration to the persuasiveness of any arguments and any secondary evidence. *In re Oetiker*, 977 F.2d 1443, 24 USPQ2d 1443 (Fed. Cir. 1992). The legal standard of "a preponderance of evidence" requires the evidence to be more convincing than the evidence which is offered in opposition to it. The examiner must weigh the power of each reference to suggest solutions to one of ordinary skill in the art, considering the degree to which one reference might accurately discredit another. With regard to rejections under 35 U.S.C. 103, the examiner must provide evidence which as a whole shows that the legal determination sought to be proved (i.e., the reference teachings establish a *prima facie* case of obviousness) is more probable than not. MPEP 2142.

We now turn to the references. Singhal is a paper that focuses on the process of spoken document retrieval (SDR) and retrieval from a very large collection (VLC). The portion that is relevant to the present invention is the SDR approached (section 3) cited by the Examiner. Singhal involved processing documents created from automatic speech recognition from a database of test data using the NA News corpus which includes documents of text from recognizing news broadcasts. Singhal, Section 3.2. As noted in the section entitled "Lattice Based Document Expansion", the purpose of document expansion in the paper is that "the one-best approach from a recognizer misses many content words and adds some spurious words to the spoken document. The misses reduce the word-recall ... and the spurious words reduce the word-precision.... We believe that information retrieval algorithms would benefit from a higher word recall and are robust against poor word

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precision.” Therefore, Singhal uses document expansion to compensate for errors in speech recognition in retrieving documents generated from speech recognition.

Singhal goes on to explain that the purpose of document expansion in his paper is to bring new words into a document and for speech recognized documents. A word lattice associated with parallel sources of information to the spoken document (other news reports for the same day) will contain words that are similar to the recognized words and could have been said instead of the words recognized in the one-best transcription.

The focus here is that the document expansion process in Singhal’s analysis is the corruption of the text because of the imperfections in the automatic speech recognition process. Therefore, Singhal is seeking to utilize expanded documents from the original spoken document to improve upon the errors in speech recognition such that later document retrieval is more accurate. As we shall see, the focus and purpose of Singhal differs from Hutson such that there is insufficient motivation to combine these references.

Hutson teaches an invention for real-time information analysis of textual material. He mentions that his multi-dimensional processing and display system is used with textual data in ASCII or text form. The text files can come from any source, including speech recognition. Col. 2, lines 7 - 12. He does mentions that the matrices based on the textual document may enhance or suppress certain words. What is missing from Hutson’s teachings however, is any similar context to that of Singhal. For example, it appears that Hutson *assumes* that the automatic speech recognition process was perfect. In no place other than col. 2, line 11 does Hutson mention speech recognition or errors in speech recognition. The analysis used by Hutson to process the text files is singular value decomposition (SVD). Col. 2, line 31. SVD processes the text to identify groups of singular vectors to enhance lexical, semantic, and/or textual constructs and to diminish other features within the textual data. Col. 2, lines 45-49. SVD is further used to decompose the matrix into its lexical, semantic,

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and/or textual structures and their relative important in the document and relative position in the document. Col. 4, especially lines 5 - 9.

Throughout the analysis in Hutson, there is no mention of using SVD to handle or manage any problems or errors due to speech recognition. Again, Hutson considers the text to be perfect or good enough to not mention the possibility of any problems. This makes sense in that the main analysis in Hutson is text document analysis wherever the document came from. The reference to speech recognition is a throw-away line meant to note that the text files can come from anywhere. Since there is no other mention of speech recognition, clearly Hutson is not focused and does not consider how to manage and improve the text document containing speech recognition errors.

The Examiner asserts that Hutson teaches "removal" of unwanted words - but then expands that to states that in this case the unwanted words are those not recognized by the recognizer. O.A, page 3. Hutson simply fails to teach removing all terms in the vectors that are not recognized by the recognizer, thereby creating truncated vectors. As noted above, Hutson assumes perfect speech recognition. Therefore, if the speech recognition is perfect, then the text documents processed by Hutson would not contain any "terms ... not recognized by the recognizer." Any removal of unwanted terms in Hutson is based on the SVD analysis of the lexical, semantic and or textual constructs. The parameters associated with the SVD analysis in Hutson do not encompass the recited step in claim 1 of truncating the vectors by removing all terms in the vectors that are not recognized by the recognizer.

Given the discussion above, Applicants submit that (1) by a preponderance of the evidence there is insufficient motivation or suggestion to combine Hutson with Singhal; and (2) even if combined, these references would not teach each claim limitation.

Regarding (1), Applicants respectfully submit that since speech recognition is only referenced once and in passing in Hutson, and further since Hutson assumes an error-free text document, that one of skill in the art would not have sufficient motivation to incorporate

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Hutson into Singhal. Singhal's focus in the spoken document retrieval analysis is to improve upon the errors in speech recognition. If Singhal was modified "by specifically providing the features as taught by Hutson", it would not provide the benefits set forth by the Examiner. The Examiner stated that the reason one of skill in the art would blend these references is for the purpose of reducing the size of the database for a more efficient search (citing Hutson, Col. 1, lines 47 - 57). However, in the Singhal paper, Section 3.2, second paragraph, they state that in the study, the NA News Corpus was utilized but that some parameters had to be changed to deal with the small size of the speech database. In other words, the Examiner's stated purpose is to use Hutson's teachings to reduce the size of the database in Singhal - but Singhal states that their study was already done on a small sized database. Accordingly, these references should not be combined because the context of each of these references differ and teach away from any such combination and further because there is no reason or motivation for one of skill in the art to utilize Hutson in Singhal for the purpose of reducing the database size where the database size is already small.

Regarding the second point (2) above, Even if Hutson's teachings were incorporated into Singhal, each of claim 1's limitations would not be taught. As discussed above, Hutson does not teach truncating the vectors by removing all terms in the vectors that are not recognized by the recognizer. This is because Hutson assumes perfect speech recognition and because Hutson teaches a SVD analysis on the text file which enhances lexical, semantic and/or textual constructs - none of which relate to terms not recognized by a speech recognizer.

Accordingly, Applicants submit that claim 1 is patentable for several reasons. First, there is by a preponderance of the evidence insufficient motivation or suggestion to combine Singhal with Hutson. Second, even if they were combined, the combination of teachings fails to teach each claim limitation. Therefore, claim 1 is patentable and in condition for allowance.

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Claims 2 - 9 each depend from claim 1 and recite further limitations therefrom.

Accordingly, each of these claims is patentable as well.

Claim 10 is patentable for the same reasons set forth above, as well as its dependent claims 11 - 17.

Similarly, computer-readable medium claims 18 - 20 are patentable as well under the reasoning set forth above.

### **CONCLUSION**

Having addressed all rejections, Applicants respectfully submit that the subject application is in condition for allowance and a Notice to that effect is earnestly solicited.

Respectfully submitted,

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